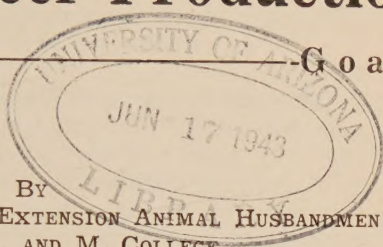


Meeting

Wartime Beef Production

Goals



BY
EXPERIMENT STATION AND EXTENSION ANIMAL HUSBANDMEN
OKLAHOMA A. AND M. COLLEGE



Feeders Day visitors at the Oklahoma Agricultural Experiment Station inspect a group of steers used in the 1942-43 beef feeding tests. Many such tests at this and other experiment stations have shown how substitute feeds can be utilized by farmers and ranchmen to meet wartime shortages.

OKLAHOMA AGRICULTURAL EXPERIMENT STATION

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Meeting Wartime Beef Production Goals

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Demand for beef during the war period is, practically speaking, unlimited. Oklahoma stockmen to meet their war goals must produce and market more beef per farm, per ranch and per animal than at any time in the state's history. This must be done with less labor and with a supply of protein supplement which the best available information indicates will be short in comparison to needs.

Plans for the future must include:

(1) The efficient use of protein supplements as a source of protein only.

(2) The use of legume hays, or winter and supplemental pastures, or grains, as substitutes for protein supplements wherever and whenever possible.

(3) The production of all hays and roughages possible, with particular attention to quality by cutting at the proper time and preservation of green color.

(4) The most careful management in the handling of cattle, and the best possible use of available labor.

(5) The marketing of large numbers of cattle.

(6) The maximum use of pasture in fattening cattle.

PASTURE SEASON

Maximum carrying capacity can best be realized by withholding grazing until the cattle can get a mouth full and fill up. Give the grass a head start by holding cattle on winter feed, even though it is only roughage. Consider the grazing off of wheat, rye or barley pasture to produce extra weight and increase the carrying capacity of your ranch or farm.

Stock the pasture at an optimum rate for an average year. This rate should be at such an intensity that 20 to 25 percent of the forage growth will remain at the end of the grazing season. Generally speaking, this means four to six inch stubble height for bunch-type grasses and one and one-half inch stubble for sod-type grasses.

* Material assembled and put into final form by Charles S. Hobbs, Assistant Professor of Animal Husbandry (Animal Nutrition).

Bull Problems

Use more and better bulls to produce more beef. Every producer should aim for a 90 percent or better calf crop. A minimum of one good active purebred bull of the desirable type should be provided for each 25 cows. On the open-range in southeastern Oklahoma it may prove profitable to have one bull to every 15 to 20 cows. The present high prices of old bulls makes this a logical time to trade old, scrub, or inactive bulls for good young bulls.

Bulls should be fed so that they are in a good active condition, but not fat, at breeding time. A bull that is in high condition should be let down gradually to breeding condition. A fat bull turned on the range with a group of cows may drop so much in condition that he will temporarily fail to get the cows with calf.

A breeding season from June 1 to September 1 will produce a uniform group of spring calves that will not come too early and that can be handled as a uniform unit either to feed or to sell. May 1 to September 1 or earlier may be preferred by some who have sufficient feed and labor. A group of calves that can be handled as a unit will require less labor and be easier to sell. Wintering late-summer, knot-headed calves requires extra feed and labor. They are not nearly as profitable as big, thrifty, early calves.

Feeding on Grass

It is doubtful economy of both feed and labor to feed concentrates to cattle on good grass when it is in its most palatable and nutritious stage. In Oklahoma, this is from the start of the grazing season to about July. Whether it will pay to feed on grass after July is a problem of individual cases and depends on the season, the grass, the kind and condition of the cattle, cost of feed and the market. It did not pay to feed 5 pounds of cottonseed cake or $\frac{1}{2}$ cake and $\frac{1}{2}$ ground corn to aged steers grazing bluestem grass during August at Stillwater in 1942. The 1942 grass season was exceptionally good, hence results obtained during this year may not be applicable during seasons of normal or sub-normal rainfall.

Steady prices will probably prevail during the summer and for the duration, and little if any premium will be received for "beating the other fellow to the early market." Therefore, we recommend obtaining maximum grass finish and weight before supplemental feeding is considered in the better grass

areas. Keep alert to such possibilities as the August and September use of temporary pastures, or meadow aftermath on July cut meadows.

Creep Feeding

Creep feeding is recommended only for producers who have December, January and February high-quality, early maturing calves that are to be finished and that will reach market weight within a maximum of 60 days feed after weaning. Detailed information on this is given in Experiment Station Bulletin B-262.

Culling Cows

Sell all dry cows when fat and thus release the grass to other cattle. Cull and sell cows nine years old or over unless they are exceptional producers, and also sell poor milking cows with "pewee" calves. Unthrifty, poor-wintering cows should be sold before winter. It is not how much the calves weighed but how much calf-weight was weaned per cow that adds up to efficiency.

Water

Arrange the watering supply if possible so there will be an ample supply even in drought years. Adequate watering places properly located in a pasture promote uniform grazing. During the winter be sure that cattle have access to water every day. Man or beast can do without food for a longer period with less injury than they can without water.

Salt and Minerals

Provide free access to common salt for cattle at all times. In general, cattle in the eastern half of Oklahoma should have in addition to salt a simple mineral mixture composed of equal parts by weight of powdered limestone, steamed bone meal, and salt. There is no evidence to show that minerals other than those included in this simple mineral mixture need be added to common Oklahoma rations for beef cattle. Experimental work shows that the complex mineral mixtures have not proven more valuable—usually, just more expensive.

Screw Worms

Check cattle for screw worms regularly during fly season. Treat infected cases with U. S. D. A. Smear No. 62.

Dehorning, Castrating, and Vaccinating

Dehorn and castrate calves by approved methods as soon after birth as practicable (before 3 months old). Dehorning young calves with a hot bell-shaped iron is one of the latest and best methods. Oklahoma A. and M. College veterinarians recommend that calves be vaccinated for blackleg twice for maximum immunity, first at about four months of age and again at weaning time. For greatest immunity vaccinate calves for hemorrhagic septicemia (shipping fever) with bacterin about two weeks before weaning or shipping and again with aggressin after weaning. Loss of beef through neglecting to use established preventive vaccination methods is equivalent to aiding the Axis.

Wherever practicable, cows with heifer calves may be separated into one pasture and cows with bull calves into another pasture at one of the early workings to save shrinkage and extra labor at weaning time.

WINTERING

Give the calves good treatment and bulky laxative feeds during the weaning period. Weaning is a good time to make another cull on the herd, selling any poor-doing cattle, cattle that are not likely to make the winter, old nellies, knot-head calves, etc. A short and expensive feed supply should not be wasted on cattle of questionable ability to produce beef efficiently.

Consider an earlier weaning or delivery date if the feed and cottonseed cake situation looks bad for winter.

Sorting Cattle for Winter Feeding

Herds should be divided into groups of similar age, condition, number, greediness, etc. Less feed will be required to keep a herd in good condition if the herd has been properly divided for feeding. See that all cattle are eating their concentrates by a week after winter feeding starts.

Feeding

The basis of wintering cattle economically is the maximum use of the best quality of roughage available and sufficient supplemental feeds to balance the ration and produce the desired gain. Conditions indicate that the supply of protein supplements will continue to be inadequate with the increased

numbers of livestock, with stockmen feeding better than previously, with shortage of animal protein supplements, and with protein supplements being used for other purposes.

Beef cattle men are indeed fortunate that the protein requirement for cattle is lower than that for dairy cattle, sheep, swine, or chickens. Nor is quality of protein so important. Beef cattle are the most efficient users of large amounts of coarse roughages and grasses, which are Oklahoma's largest and most practical crops. The limited protein supply can be conserved and stretched by the following practices:

(1) The efficient use of protein supplements as a source of protein only.

One pound of cottonseed cake per head per day fed with silage or good roughage has been found by numerous experimental stations to supply sufficient protein for wintering beef cattle. About $\frac{1}{2}$ pound of 43% protein cottonseed cake or feeds containing equivalent protein, and ample good quality prairie hay or roughages of similar quality or better, will furnish the minimum protein needed to winter a thrifty beef cow. If weathered or mature prairie hay is used, or other similar poor quality feeds such as old grass, a wintering beef cow will need about $1\frac{1}{2}$ pounds or more of 43% protein cottonseed cake to furnish adequate protein. Thus the good quality roughage saves the amount of protein in a pound of protein supplement per head per day. Special attention should be given to the protein, mineral and vitamin requirement of a pregnant beef cow, especially during the months just before calving.

Likewise ample good quality prairie hay, or similar or better roughage, and about $1\frac{1}{4}$ pounds of 43% protein cottonseed cake, or protein equivalent feed, will furnish a minimum amount of protein for 400-500 pound calves being wintered. About 2 pounds of 43% protein cottonseed cake, or protein equivalent, is required when calves are given weathered or matured prairie hay or similar roughage.

Minimum protein requirements for 2-year-old or older cattle are the same as those of the cow; and requirements for yearling cattle are similar to those of calves. Remember that the amount of protein in the roughage fed during the winter largely governs the amount of protein supplement that need be added.

Kansas workers at the Hays Station (1938-39) reported the comparative value of various protein supplements fed at the rate of 1 pound per head per day with silage to wintering calves

and yearlings as follows: Cottonseed meal and corn gluten meal slightly better than soybean oil meal, then followed closely by linseed meal, tankage and peanut meal. However, the widest variation between the lowest and highest average daily gains, as a three-year average, was only 0.19 pound.

The Oklahoma station has found that 41% protein soybean pellets and 43% cottonseed cake are practically equal as weight producers when fed pound for pound as protein supplements with silage, grain, and minerals to calves being wintered to gain 225-250 pounds during the winter feeding period. In one test these two feeds were equal for cows wintered on 2 pounds per head daily of the respective supplements and plenty of old grass.

Using protein supplement feeds as a source of energy as long as the supply is short is crippling our effort to meet beef production goals and to defeat the Axis.

In fattening rations, use only enough protein supplement to balance the ration.

(2) Maximum production of high quality roughage wherever possible.

This is the cheapest and best way to decrease the need for protein supplements and increase the feed supply. Special consideration should be given in any haying or roughage curing method to the time of cutting, to the preservation of green color, and to maintaining maximum amount of leaves to produce high quality hay. Feeding tests show that good quality prairie hay contains more than four times as much digestible protein and twice as much phosphorus as mature prairie hay. Likewise, comparing analysis of average quality alfalfa hay to stemmy alfalfa hay shows that the good hay contains 29% more digestible protein and 42% more calcium and a little more total digestible nutrients and phosphorus. This should be ample evidence as to the value of producing good quality roughages. Notice that in the above comparison for wintering a cow only $\frac{1}{2}$ pound of 43% cottonseed cake was needed to balance a ration containing good quality prairie hay while $1\frac{1}{2}$ pounds cottonseed cake was needed in a ration using mature prairie hay.

Beef cattle can be wintered satisfactorily on good quality non-legume roughage with a little extra protein, along with careful management in using stalk fields, meadow aftermath, etc.

(3) Use of legume hays when possible.

Although non-legume roughages such as prairie hay, sorghum hays, fodders, cereal straws, etc., are as a class low in protein, legume hays such as alfalfa, cowpea, soybean, mungbean, clover, etc., when of good quality are relatively high in protein and calcium.

Feeding tests at the Oklahoma, Kansas, Nebraska, and other experiment stations, and practical experience likewise, definitely show that alfalfa can be used to supply additional protein needed in cattle rations. From 3 to 6 pounds of good quality alfalfa hay, depending on quality of the other feeds in the ration, will supply the additional protein needed to balance common rations fed to beef cattle in Oklahoma. Feeding tests have shown that 3 to 4 pounds of good alfalfa hay can be satisfactorily substituted for one pound of cottonseed cake as a protein supplement when fed with silage to wintering calves or yearlings.

Wherever practicable, a few acres of some annual legume can be planted to grow all or part of the extra protein needed by cattle. Mungbean, cowpea, peanut hay or other legume hay of good quality will be very satisfactory. An acre of cowpeas yielding 3000 pounds would furnish sufficient legume hay to supply the extra protein needed for five mature wintering cattle.

Be sure to include the simple mineral mixture in addition to salt to furnish extra phosphorus in wintering rations composed of roughages. If good rations contain one pound or more of cottonseed cake or feeds having as much phosphorus, feeding tests have shown that no additional phosphorus need be supplied.

(4) Use of winter pasture when available.

Young, growing pasture in its most nutritious and palatable stage is high in good quality protein. Beef cattle grazing such good green pasture will usually get sufficient protein. Winter wheat, oats, barley, rye or rye grass can be planted in the fall to furnish additional feed that will be very nutritious and supply part or all of the extra protein needed. Some ex-

periments indicate that with good winter grazing conditions about one acre of wheat pasture with a little dry feed for bad weather will winter a beef animal. However, it is unsafe to depend entirely on winter pasture for protein or feed supply.

(5) Use of farm grains in wintering rations.

Farm grains such as ground wheat, oats, barley, corn or grain sorghums can be satisfactorily substituted for the major portion of the protein supplement in wintering rations but not in fattening rations. In either wintering or fattening rations, farm grains may be used pound for pound to replace the amount of protein supplement fed in excess of the protein requirement.

Oklahoma, Kansas and Nebraska tests indicate that about 2 pounds or a little more of ground wheat, barley, oats, or corn may be used as a substitute for 1 pound of cottonseed cake for wintering cattle fed silage or other good roughage. It will take about 3 pounds of ground grain sorghums to replace 1 pound of cottonseed cake.

If the roughage is of poor quality, more of the ground grains will probably be needed to replace one pound of protein supplement.

At the present prices of grains and cottonseed cake, cottonseed cake is a much cheaper source per unit of protein than are the grains.

Silage

Much more beef can be produced from an acre of sorghums fed in form of silage than when it is fed as forage. In a series of tests at the Kansas Branch Experiment Station at Hays, an acre of kafir fed as silage produced 2.2 times as much beef as an acre fed as fodder. An acre fed chopped produced 1.13 times as much; and an acre fed ground produced 1.28 times as much. (1 pound cottonseed meal per head daily was fed in all cases.)

Concentrates for Fattening

The Oklahoma Experiment Station has tested many substitutes for corn for fattening cattle in dry lot—cottonseed cake, ground and whole oats, ground barley, ground kafir, etc. Most of these feeds were about equal as weight producers but oftentimes produced fat cattle that sold at a lower price per

100 pounds than corn-fed cattle. With the present small premium paid for slightly higher finish on cattle, these corn substitutes will prove more nearly equal to corn. The price per pound of nutrients in the feed will be the deciding factor. If more information is desired, see your county agent or write to the Oklahoma A. and M. College for mimeographed reports of the feeding tests or for other information about the feeding value of the different grains.

Feeding tests at Oklahoma Experiment Station show that the feeding of coarsely ground wheat mixed with silage and sufficient protein supplement to balance a ration proved to be an easy, safe and satisfactory way to substitute wheat for corn in fattening beef calves. (See Experiment Station Mimeographed Circular No. 95). No bloat, digestive disturbances or other feed-lot troubles resulted which could be blamed on the wheat fed. This information is specially important as Government feeding wheat has been one of the cheapest sources of concentrates in many sections.

Present market prices of cattle place emphasis on pounds of beef rather than superior finish. Stockmen who have large frame, thin cattle, such as old cows or big steers, can make good use of large amounts of coarse, usually cheap, roughages such as stalk fields, silage, bundle fodder, cottonseed hulls, etc., with a little protein supplement fed to produce more beef. Utilizing fields of grain sorghums by grazing is practicable and saves labor.

Protein Supplements for Fattening

Cattle fed fattening rations containing too little protein require more feed per 100 pounds gain than do cattle fed rations containing adequate protein. Grains cannot be efficiently used as substitutes for protein supplements to supply protein in a fattening ration. Good quality alfalfa hay or other legume hay can be used to supply added protein needed in addition to farm grains. About 4 pounds of alfalfa hay may be used to replace 1 pound of protein supplement, and about 6 pounds will supply adequate protein when fed with farm grains to balance the ration for fattening beef cattle. However, 6 pounds of alfalfa hay may be more bulk than a beef calf can consume and make rapid gains in fattening.

Fattening rations using non-legume roughages (silage, cottonseed hulls, prairie hay, etc.) should have protein and a calcium supplement added to the ration in addition to salt.

MISCELLANEOUS

Grinding Grains

Do not waste labor, machinery, gasoline or electric current grinding corn or oats for beef cattle under 10 months of age. Coarsely ground grains are not only more suitable and palatable for cattle but also take much less labor and power and cause less wear and tear on machinery than fine or medium grinding. Chopping bundle feed is not recommended. Grinding bundle feed, if it grinds the grain on the head, will increase its value 28 percent; but silage is superior and entails but little more total labor.

Ox Warbles

If materials are available, treat cattle for ox warbles according to approved, recommended methods to insure more good leather for war and civilian needs as shoes, etc.